

A Revision of the Genus *Jankowskia* OBERTHÜR (Lepidoptera, Geometridae)

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Synopsis Four species mixed up under the name of *Jankowskia athleta* OBERTHÜR are dealt with and keyed. *J. athleta* OBERTHÜR and *J. fuscaria* (LEECH), sp. rev., are redescribed. Two new species, *J. taiwanensis* sp. nov. from Taiwan and *J. pseudathleta* sp. nov. from Japan, and a new subspecies of *J. fuscaria*, *J. f. naitoi* ssp. nov. from Is. Amami-ōshima and Is. Okinawa, are described.

The genus *Jankowskia* was erected by OBERTHÜR in 1884 for a new species, *athleta* OBERTHÜR from Sidemi near Vladivostok, South Ussuri. Recently, I had an opportunity to study a number of specimens of *Jankowskia* from Japan, and found that two species were mixed up under the name, *J. athleta*. I sent them to Mr. D. S. FLETCHER, British Museum (Nat. Hist.), asking for a comparison of my specimens with the types preserved in that museum. Mr. FLETCHER kindly examined the type of *fuscaria* LEECH, *geloia* WEHRLI and *nanaria* BRYK, and sent me on loan a pair of specimens of *athleta* from Ussuri. He wrote to me that one of the Japanese species is identical with the type of *fuscaria* and that the other species is distinct not only from *athleta* but also from any others.

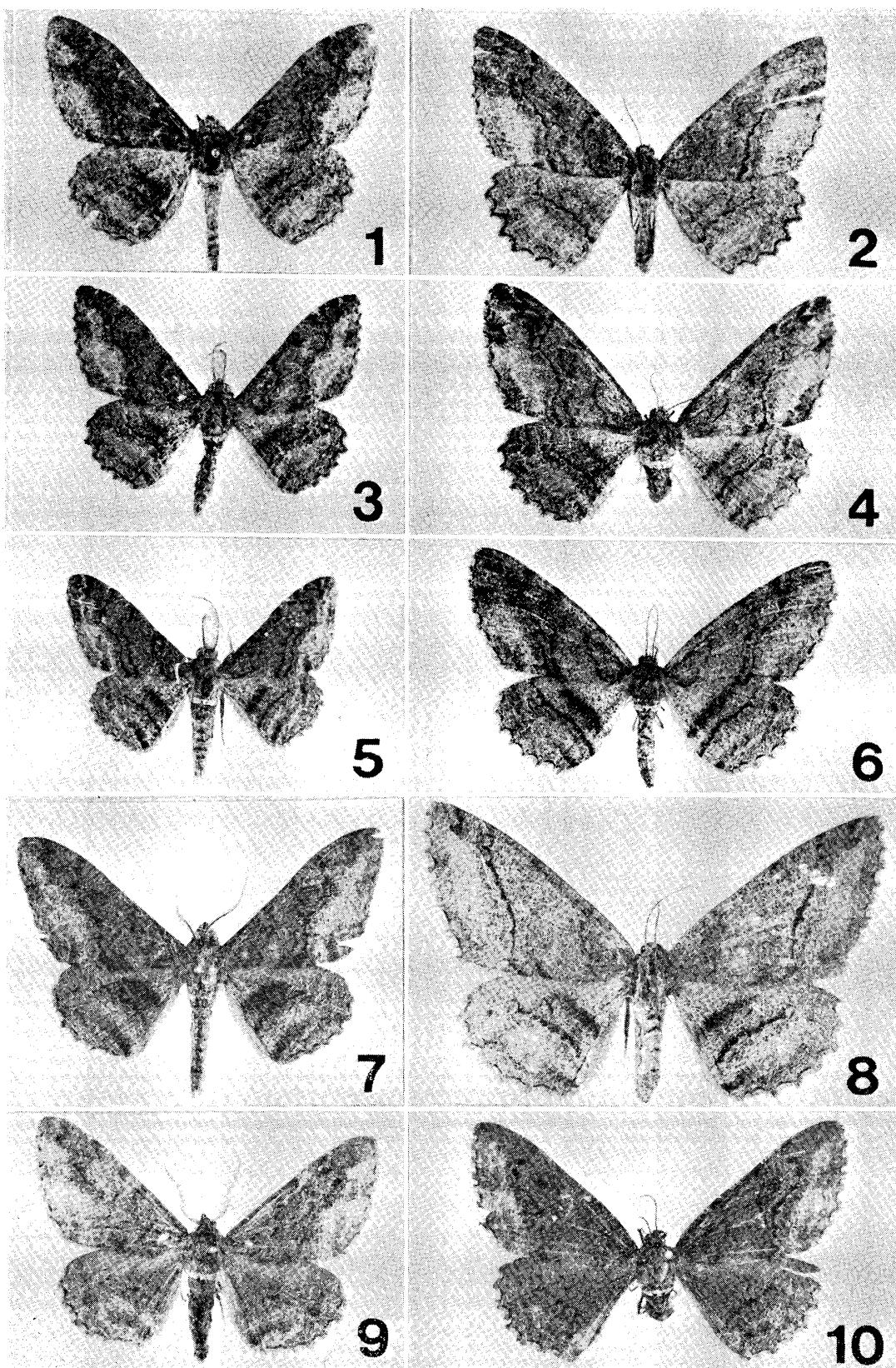
In this paper I will give redescriptions of *athleta* OBERTHÜR and *fuscaria* LEECH, together with the descriptions of two new species and one new subspecies of *fuscaria*. The holotypes of the new taxa designated in this paper are deposited in the National Science Museum, Tokyo.

Genus *Jankowskia* OBERTHÜR

Jankowskia OBERTHÜR. 1884, Étud Ent., 9: 25.

Head with eyes large, round and wider than front in male, smaller than those of male in female; front flat. Proboscis short. Palpus porrect or slightly upturned, extending slightly beyond front; the second segment long; the third segment very short. Male antenna bipectinate, pectinations arising from the base of each segment; densely ciliate ventrally, fully scaled dorsally and without terminal bristle; several terminal segments simple. Female antenna simple. Male without cluster of spines on anterior margin of third abdominal sternite. Hind tibia of male generally with small hair-pencil, sometimes lacking. Forewing with a fovea in male; 12 veins present; vein Sc free; veins R_1 and R_2 free, rarely shortly stalked; R_{3-5} on long stalk; M_1 from upper angle; Cu_1 from before lower angle; in female R_1 entirely coincident, rarely short-stalked with R_2 . Hindwing with $Sc+R_1$ approximate to basal half of upper margin of cell; R_5 from before upper angle; Cu_1 from before lower angle.

Male genitalia: Uncus triangular, longer than wide, with a weak lateral pro-



Figs. 1-10. *Jankowskia* spp. 1-2. *J. athleta* OBERTHÜR. 1 ♂; 2 ♀, Ussuri, USSR. In coll. British Museum (N. H.). 3-4. *J. fuscaria fuscaria* (LEECH). 3 ♂; 4 ♀. Is. Sado. 5-6. *J. fuscaria naitoi* ssp. nov. 5 ♂, holotype; 6 ♀, paratype. Is. Amami-ōshima. 7-8. *J. taiwanensis* sp. nov. 7 ♂, holotype; 8 ♀, paratype. Nantou, Taiwan. 9-10. *J. pseudathleta* sp. nov. 9 ♂, holotype, Sapporo, Hokkaido; 10 ♀, paratype, Kakumi, Niigata Pref.

jection on each side and with a hooked-tip at apex. Medial plate of gnathos small, narrowly rounded at tip. Tegumen broad with a narrow process of varying length arising on each side posteriorly, apically with group of long setae extending posteriad of uncus. Valva elongate, slightly broadened and smoothly rounded apicad, with large areas of long setae at posterior and ventral regions. Juxta almost symmetrical or asymmetrical, narrowed medially, bearing a small projection posteriorly. Aedeagus almost cylindrical, short, as long as dorsal margin of valva, with rounded apex. Vesica with a single elongate cornutus.

Female genitalia: Ovipositor very long, retractile. Sterigma with sclerotized, round or elliptical median area, having a series of concentric, semicircular ridges medially, and with ribbon-like lateral sclerotization. Ductus bursae very weakly sclerotized, with longitudinal striations. Bursa copulatrix pouch-like or pyriform, membranous, bearing one large signum with a few or many spines.

Key to species of *Jankowskia* based on external characters

1. Upper surface of wings with outer area pale reddish brown; hind wing with basal area pale gray, contrasting with the rest of wing; medial fascia of hind wing usually present..... 2
- Upper surface of wings with outer area moderately olive brown; hind wing with basal area concolorous with the rest of wing; medial fascia of hind wing absent or obscure..... *pseudathleta* sp. nov.
2. Larger species, with length of forewing 25–30 mm (♂), 30–37 mm (♀); under surface of forewing with costa almost concolorous with the rest of wing.... 3
- Smaller species, with length of forewing of vernal brood 22–24 mm (♂), 26–28 mm (♀); under surface of forewing yellowish along costa..... 4
3. Medial fascia of hind wing broader, more than twice as wide as postmedial fascia *taiwanensis* sp. nov.
- Medial fascia of hind wing narrower, slightly wider than postmedial fascia *athleta*
4. Forewing without brown band followed by subterminal fascia, having outer area not tinged with yellow; hind wing with postmedial fascia out-curved anteriorly *fuscaria fuscaria*
- Forewing with brown band followed by subterminal fascia, having outer area tinged with yellow; hind wing with postmedial fascia almost smooth *fuscaria naitoi* ssp. nov.

Key to species of *Jankowskia* based on male genitalia

1. Juxta almost symmetrical..... 2
- Juxta asymmetrical..... 3
2. Posterior processes of tegumen longer, about 3.5 times as long as the basal width, the apex extending well beyond the lateral projection of uncus..... *athleta*
- Posterior processes of tegumen shorter, about 1.5 times as long as the basal width, the apex almost level with the lateral projection of uncus

- *pseudathleta* sp. nov.
- 3. A triangular projection of juxta larger, about one-third as long as the length of juxta..... *taiwanensis* sp. nov.
- A triangular projection of juxta smaller, less than one-fifth as long as the length of juxta..... 4
- 4. Posterior processes of tegumen longer, twice as long as the basal width, the apex posterior to lateral projections of uncus..... *fuscaria fuscaria*
- Posterior processes of tegumen shorter, almost as long as the basal width, the apex level with or slightly posterior to lateral projections of uncus
..... *fuscaria naitoi* ssp. nov.

Key to species of *Jankowskia* based on female genitalia

- 1. Ductus bursae long and slender..... 2
- Ductus bursae short and stout..... 3
- 2. Ductus seminalis arising near posterior end of bursa copulatrix; signum elongated circular with many short spines..... 4
- Ductus seminalis arising near ostium; signum rectangular with 4–6 long spines
..... *pseudathleta* sp. nov.
- 3. Signum elongated circular with 13–15 long spines..... *taiwanensis* sp. nov.
- Signum almost hexagonal with about 6 short spines..... *athleta*
- 4. Signum with posterior margin evenly rounded, bearing 20–23 minute spines
..... *fuscaria fuscaria*
- Signum with posterior margin irregularly shaped, bearing 8–13 short spines
..... *fuscaria naitoi* ssp. nov.

Jankowskia athleta OBERTHÜR (Figs. 1, 2)

Jankowskia athleta OBERTHÜR, Étud. Ent., 9: 25, pl. 2: 7.

Length of forewing: ♂ 25 mm, ♀ 30 mm.

Male. Head black, with a few greyish scales; palpus black with a few yellowish grey scales. Tegula, patagia and thoracic vestiture dark brown. First abdominal segment with greyish white band dorsally, remaining segments dark brown. Upper surface of wings dark greyish brown, irrorate with black, and suffused with pale reddish brown distad of postmedial fascia. Terminal fascia black, crenulate. Sub-terminal fascia inconspicuous. Medial fascia appearing vaguely in posterior half of wing, paralleling with postmedial fascia. Antemedial fascia oblique, black and defined. Postmedial fascia black, well defined, undulated. Hind wing with basal area pale grey, contrasting with the rest of wing. Antemedial fascia absent. Medial fascia black, broad and straight. Postmedial fascia black, almost smooth. Under surface brown, not tinged with yellow at costal area. Postmedial and medial fascia weakly defined.

Female. Similar in pattern to male, differing in reduction of reddish brown suffusion distad of postmedial fascia.

Male genitalia (Fig. 11). Posterior processes of tegumen long, about 3.5 times

as long as the basal width, the apex extending well beyond the lateral projection of uncus. Medial plate of gnathos about two-fifths as broad as cucullus. Juxta nearly symmetrical with a small, triangular unsclerotized projection. Cornutus elongate, tapered, about one-half as long as the length of aedeagus.

Female genitalia (Fig. 16). Ductus bursae short, gradually increasing in width anteriorly, the widest portion almost as broad as central area of sterigma. Ductus seminalis arising near posterior end of bursa copulatrix. Signum almost hexagonal with about 6 short inwardly pointed spines.

Material examined. USSR—1 ♂, Vladivostok, South Ussuri, vii. 1923 (N. KARDAKOFF), 1 ♀, Narva, South Ussuri, 26. vii. 1921 (N. KARDAKOFF) in coll. British Museum (N. H.).

Distribution. Manchuria, Ussuri, Amur.

Ecological notes. Host plant unknown.

Remarks. This species is closely allied to the next species, and distinguishing characters will be noted under that species.

Jankowskia fuscaria (LEECH) sp. rev.

Boarmia fuscaria LEECH, 1891, Entomologist, 24, Suppl.: 45.

Boarmia unmon SONAN, 1934, Kontyû, 8: 212, fig. 1. **Syn. nov.**

Boarmia athleta geloia WEHRLI, 1941, in Seitz, Macrolep., Suppl., 4: 469, pl. 41: e. **Syn. nov.**

Boarmia (Jankowskia) athleta nanaria BRYK, 1948, Arkiv Zool., 41 A (1): 200. **Syn. nov.**

Closely related to *athleta*, but much smaller in size and differing in the following characters.

Male. Antenna with 55–58 segments, 14–16 terminal segments simple, the longest pectinations about 5 times as long as their basal segments. Subterminal fascia grey, undulated. Hind wing with postmedial fascia almost smooth or curved outwards anteriorly according to localities. Costal area of under surface of forewing tinged with yellow.

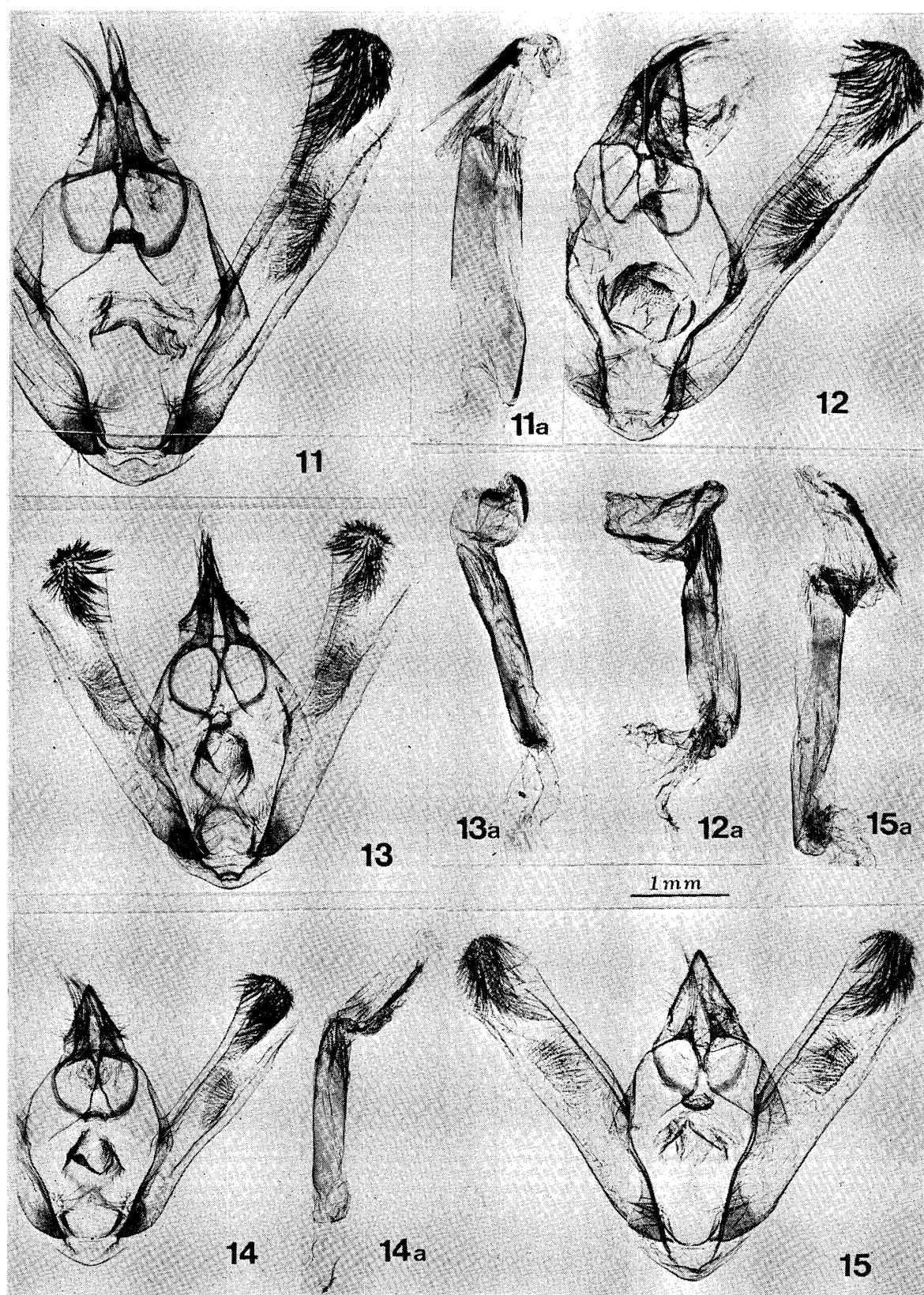
Female. Similar in pattern to male, differing in reduction of black irroration.

Male genitalia. Posterior processes of tegumen geographically vary in length. Juxta asymmetrical, scobinate posteriorly, left side with a small triangular posterior projection, right side membranous or weakly sclerotized posteriorly. Cornutus short, about one-fourth as long as the length of aedeagus.

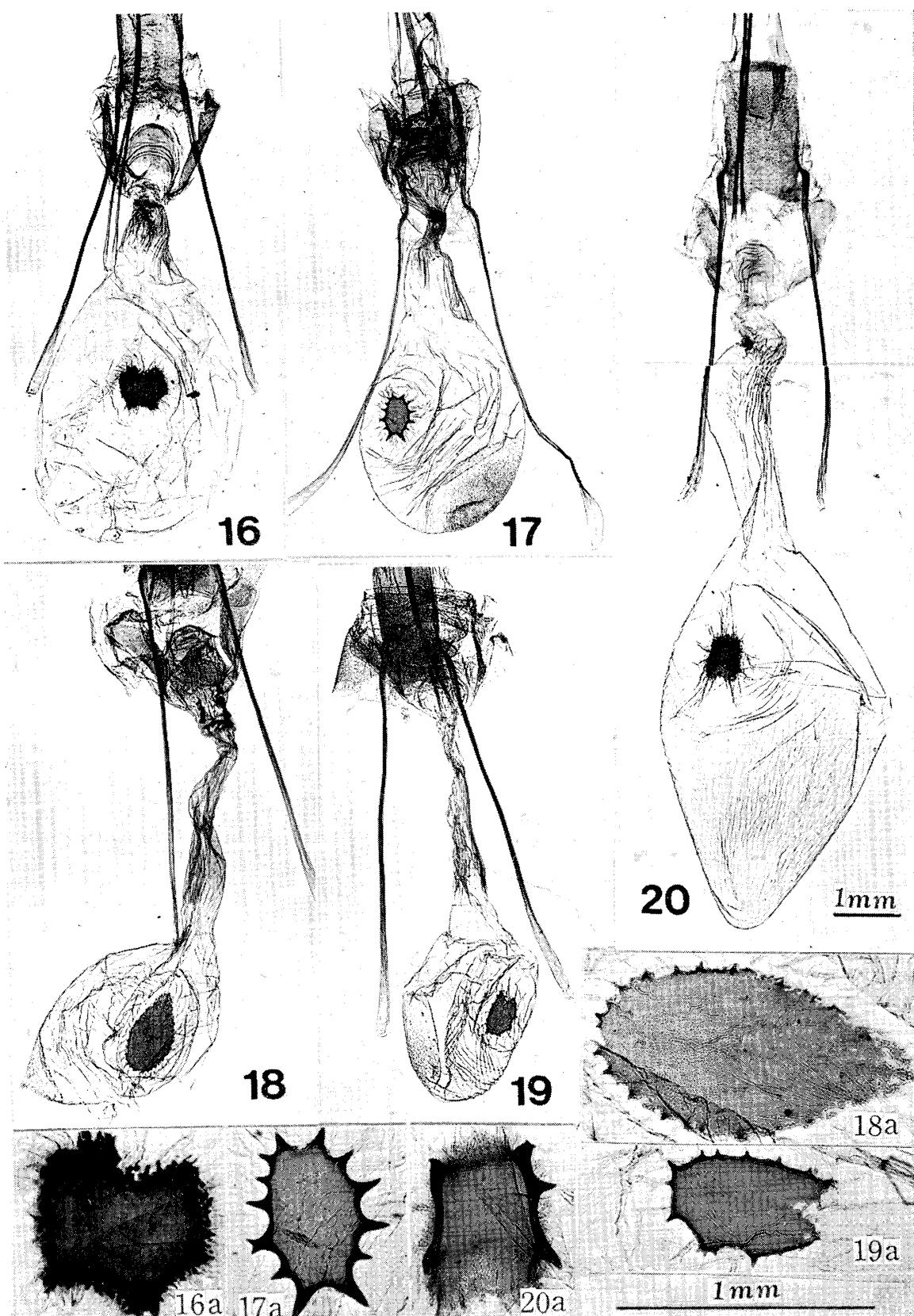
Female genitalia. Ductus bursae long and slender, slightly tapering posteriorly, the widest portion being narrower than central area of sterigma. Signum geographically variable in shape.

This species was described from Oiwake, Nagano Pref. based on one male and two females. I have not yet seen the holotype (♀) of *Boarmia unmon* SONAN from Shizuoka Pref., but have examined the specimens (6 ♂, 6 ♀) of this species collected at the type-locality by Dr. J. MINAMIKAWA (formerly J. SONAN), now preserved in the National Institute of Agricultural Sciences, Tokyo. Judging from these collections and the original description accompanying an excellent figure, I am confident that *B. unmon* is a synonym of this species. The fact that the type-specimen was collected in September strengthens my belief.

Mr. FLETCHER took the trouble for me to re-examine a paratype of *Jankowskia*



Figs. 11-15. Male genitalia of *Jankowskia* spp. (a) aedeagus. 11. *J. athleta* OBERTHÜR.
BM slide. 12. *J. taiwanensis* sp. nov. Paratype. Slide RS-908. 13. *J. fuscaria*
fuscaria (LEECH). Slide RS-692. 14. *J. fuscaria naitoi* ssp. nov. Paratype.
Slide RS-686. 15. *J. pseudathleta* sp. nov. Paratype. Slide RS-697.



Figs. 16-20. Female genitalia of *Jankowskia* spp. (a) signum. 16. *J. athleta* OBERTHÜR.
BM slide. 17. *J. taiwanensis* sp. nov. Paratype. Slide RS-783. 18. *J. fuscaria*
fuscaria (LEECH). Slide RS-688. 19. *J. fuscaria naitoi* ssp. nov. Paratype.
Slide RS-690. 20. *J. pseudathleta* sp. nov. Paratype. Slide RS-696.

athleta geloia WEHRLI from SE. China and one of the syntypes of *Boarmia (Jankowskia) athleta nanaria* BRYK from Korea, and confirmed that both types are identical with the present species.

This species will be divided into two subspecies, characterized by colour and pattern of both wings and by the modification of genitalia.

Jankowskia fuscaria fuscaria (LEECH) (Figs. 3, 4)

Length of forewing: vernal brood, ♂ 22–25 mm, ♀ 26–29 mm, aestival and autumnal brood, ♂ 18–20 mm, ♀ 21–25 mm.

Male. Maculation of wings weakly developed in general. Outer area of wings pale reddish brown, not tinged with yellow. Forewing without brown band followed by subterminal fascia, which is inconspicuous in most specimens. Hind wing with postmedial fascia curved outwards anteriorly.

Female. Similar in pattern to male, differing in reduction of black irroration.

Male genitalia (Fig. 13). Posterior processes of tegumen long, twice as long as the basal width, the apex extending to a level posterior to the lateral projections of uncus. Triangular projection of juxta one-fifth as long as the length of juxta.

Female genitalia (Fig. 18). Signum elongated circular, with posterior margin evenly rounded, bearing 20–23 minute spines.

Material examined. 71 ♂, 34 ♀. Honshû—Miyagi Pref.: Togatta, 3 ♂ (vi, vii, ix). Niigata Pref.: Mt. Yahiko, 1 ♂, ex larva on *Ilex crenata* (ix); Mt. Kakuda, 1 ♂, ex larva on *Ilex crenata* (vi); Ogi, Is. Sado, 16 ♂, 3 ♀ (vi, vii, ix). Gunma Pref.: Mikaboyama, 1 ♂ (ix). Nagano Pref.: Tenpakudai, Nagiso, 2 ♀ (vi, ix). Saitama Pref.: Bushi, Iruma City, 2 ♂, 5 ♀ (vii, ix); Arakawa, 1 ♀ (viii). Tokyo: Mt. Takao, 5 ♂ (vii, viii, ix); Itsukaichi, Musashi, 1 ♂ (viii). Kanagawa Pref.: Tanzawa, 1 ♀ (vii); Odarumi, 1 ♂, 1 ♀ (ix). Shizuoka Pref.: Nashimoto, Izu, 4 ♂, 1 ♀ (vi, vii, viii); Kanaya, type-locality of *Boarmia unmon*, 6 ♂, 6 ♀ (v, vi, viii, ix, x) in coll. National Institute of Agricultural Sciences. Gifu Pref.: Shiratani, Tokuyama, 1 ♂ (ix); Yôrô Park, 1 ♂ (vii). Aichi Pref.: Shinshiro, Sakurabuchi Park, 1 ♂ (x). Mie Pref.: Gegû, 1 ♀ (ix); Sekisuikei, 1 ♀ (vii); Takihara, 3 ♀ (ix); Mt. Fujiwara-dake, 1 ♂ (vii). Wakayama Pref.: Ôsugi-dani, Mt. Ôto-san, 1 ♂, 1 ♀ (vii). Hyôgo Pref.: Mt. Mikusa, Inagawa, 1 ♂ (vi). Okayama Pref.: Tanei, Sôja City, 1 ♂ (ix); Shinnari-wagawa-dam, Bichû, 1 ♀ (viii). Shikoku—Kagawa Pref.: Dôno, Shionoe, 2 ♂, 1 ♀ (vi, ix); Ôkubo-ji, Nagao, 1 ♀ (ix). Kôchi Pref.: Murotomisaki, 1 ♂ (ix). Kyûshû—Fukuoka Pref.: Ômuta City, 2 ♂ (vi). Kumamoto Pref.: Tategamikyô, Miyano-hara, 1 ♂ (viii); Okawachi, Yamae, 1 ♂, 2 ♀ (vi); Mt. Gotaro, Amakusa, 2 ♂ (vi). Kagoshima Pref.: Yunotai, Mt. Kirishima, 1 ♂ (v). Is. Tsushima—Gaya, 1 ♂ (vi); Oboshiyama, 1 ♀ (vii); Uchiyama, 1 ♂, 1 ♀ (vi). Is. Yakushima—Aikodake, 1 ♂, 1 ♀ (x); Shitoko, 3 ♂ (viii); Suzukawa, 1 ♂ (viii); Kusukawa, 3 ♂ (x); Miyanoura, 2 ♂, 1 ♀ (x); Kurio, 1 ♂ (x). Korea—Kwangnung, 1 ♂ (vi).

Distribution. Japan: Honshû, Shikoku, Kyûshû, Tsushima, Yakushima; Korea, China.

Ecological notes. This species, well-known as the three brood tea looper, occasionally outbreaks in large numbers and does extensive damage to tea plant, *Thea*

sinensis. The lifehistory, as reported under the name of *athleta* by MINAMIKAWA (1951), may be summarized as follows: Trivoltine. Adults of the 1st generation emerge from May to June, larvae hatch out in June and pupate in July. Adults of the next generation emerge in August, larvae hatch out in the same month and pupate in September. Adults of the last generation emerge in October, larvae hatch out in the same month, and the 2nd to 4th instar larvae overwinter.

There may be confusion in the literature regarding host plants, because of misidentifications of the species, but I re-examined all the specimens reared on the following plants by earlier authors.

Host plants: *Quercus serrata*, *Q. aliena* (Fagaceae); *Prunus yedoensis*, *Malus sieboldii*, *Rosa multiflora* (Rosaceae); *Ilex crenata* (Aquifoliaceae); *Thea sinensis* (Theaceae); *Parabenzoin praecox* (Lauraceae) (SATO & NAKAJIMA, 1975; NAKAJIMA, 1975; SATO, 1976).

Remarks. The nominate subspecies ranges from northern Honshû to Is. Yaku-shima. However, it is confined to low altitude near the northern limit of its distribution, which so far known is Niigata Prefecture.

Jankowskia fuscaria naitoi ssp. nov. (Figs. 5, 6)

Length of forewing: vernal brood, ♀ 27 mm, aestival and autumnal brood, ♂ 18–21 mm, ♀ 24–26 mm.

Distinguished from the nominate subspecies by the following characters.

Male. Upper surface of wings darker in colour, with well-visible pattern. Outer area of wings pale reddish brown, tinged with yellow. Forewing with broken brown band followed by subterminal fascia, which is visible in most specimens. Hind wing with medial fascia much broader and postmedial fascia almost smooth.

Female. Outer area of wings almost concolorous with the rest of wings.

Male genitalia (Fig. 14). Posterior processes of tegumen much shorter, almost as long as the basal width, the apex level with or slightly posterior to lateral projections of uncus. Triangular projection of juxta much smaller, one-sixth as long as the length of juxta.

Female genitalia (Fig. 19). Signum smaller, elongated circular, with posterior margin irregularly shaped and bearing 8–13 spines, which are longer than those of the nominate subspecies.

Material examined. 57 ♂, 6 ♀.

Holotype: ♂, Is. Amami-ōshima, Mt. Yuwan-dake, 9–11. viii. 1977 (T. NAITO). Paratypes: Is. Amami-ōshima—8 ♂, 1 ♀, same data as holotype (T. NAITO); 2 ♂ same data as holotype (K. NAKANO); 7 ♂, 3 ♀, type locality, 15–17. viii. 1977 (R. SATO); 2 ♂, loc. cit., 15–17. viii. 1977 (K. NAKANO); 23 ♂, 1 ♀, Hatsuno, 11–13. viii. 1977 (R. SATO); 11 ♂, Mt. Yui-dake, 13–15. viii. 1977 (R. SATO). Okinawa—1 ♂, Yonahadake, 11. vii. 1967 (S. AZUMA); 2 ♂, Yona, 18. ix. 1963 (H. HASEGAWA); 1 ♀, loc. cit., 2. v. 1976 (H. SUNAKAWA).

Distribution. Japan: Amami-ōshima, Okinawa.

Ecological notes. Host plant unknown. Larvae hatched from eggs laid by captured females taken at the type-locality were successfully reared on *Prunus yedoensis*

(Rosaceae), *Salix babylonica* (Salicaceae) and *Quercus serrata* (Fagaceae). Probably polyphagous.

Remarks. This subspecies is relatively constant in coloration, though the nominate subspecies is variable. It is my pleasure to name this subspecies after Mr. T. NAITO, Niigata, as a token of appreciation of his frequent field works in Amami-ôshima and Okinawa.

***Jankowskia taiwanensis* sp. nov. (Figs. 7, 8)**

Length of forewing: ♂ 26–30 mm, ♀ 33–37 mm.

Closely related to *fuscaria*, but much larger in size and differing in the following characters.

Male. Ground colour unstable, but in general lighter. Antenna with 60–63 segments, 20–23 terminal segments simple, the longest pectinations shorter, about 3.5 times as long as their basal segments. Forewing with postmedial fascia tending to be diffused near the posterior margin. Hindwing with medial fascia much broader, more than twice as wide as postmedial fascia.

Female. Forewings with postmedial fascia almost smooth in most specimens. Outer area of wings almost concolorous with or slightly lighter than the rest of wings.

Male genitalia (Fig. 12). Posterior processes of tegumen shorter, about 1.5 times as long as the basal width, the apex being posterior to the lateral projections of uncus. Juxta asymmetrical, scobinate posteriorly, left side with a larger triangular posterior projection, about one-third as long as the length of juxta, right side with a short heavily sclerotized projection posteriorly.

Female genitalia (Fig. 17). Ductus bursae short, gradually increasing in width anteriorly, the widest portion wider than central area of sterigma. Signum smaller, elongated circular, with 13–15 long, stout inwardly pointed spines.

Material examined. 18 ♂, 4 ♀.

Holotype: ♂, Taiwan—Lushan, Nantou, 29. vi. 1973 (M. YAMAMOTO). Paratypes: Taiwan—1 ♂, same data as holotype (M. YAMAMOTO); 1 ♂, 1 ♀, Hotso, Nantou, 26–29. vi. 1973 (M. OWADA); 1 ♂, Holuan, Nantou, 23. vii. 1928 (I. SUGITANI); 1 ♂, Wulai, Taipei, 23. v. 1968 (Y. WATANABE); 6 ♂, 2 ♀, Wushe, Nantou; 6 ♂, 1 ♀, Puli, Nantou; 1 ♂, Central Mts. The specimens from Wushe, Puli and Central Mts. were secured by unknown native collectors.

Distribution. Taiwan.

Ecological notes. Host plant unknown.

Remarks. The present new species is apparently the counterpart of *fuscaria* in Taiwan.

***Jankowskia pseudathleta* sp. nov. (Figs. 9, 10)**

Length of forewing: ♂ 20–23 mm, ♀, 25–29 mm.

Similar to *fuscaria*, differing in the following characters.

Male. Antenna 53–56 segments, 10–13 terminal segments simple, the longest pectinations shorter, about 3.5 times as long as the basal segments. Upper surface of

wings darker in colour and with maculation tending to be obscure. Outer area of wings moderate olive brown. Forewing with broken brown band followed by sub-terminal fascia, which is obscure in most specimens. Hindwing with medial fascia faintly represented or vanished; basal area concolorous with the rest of wing. Under surface of wings darker, more strongly tinged with yellow at costal area of forewing.

Female. Darker in colour, with the pattern less defined than in male.

Male genitalia (Fig. 15). Posterior processes of tegumen shorter, about 1.5 times as long as the basal width, the apex almost level with the lateral projections of uncus. Medial plate of gnathos about three-fifths as broad as cucullus. Juxta nearly symmetrical, very weakly scobinate posteriorly, with a weakly sclerotized triangular projection postero-medially. Cornutus elongate, more than a half as long as the length of aedeagus.

Female genitalia (Fig. 20). Ductus bursae with almost parallel sides, slightly wider than central area of sterigma. Ductus seminalis arising nearer to ostium than to posterior end of ductus bursae. Signum smaller, tending to be more or less rectangular, with 4–6 long inwardly pointed spines.

Material examined. 74♂, 17♀.

Holotype: ♂, Hokkaido—Sapporo, 10. vii. 1975 (I. TATEYAMA). Paratypes: Hokkaido—1♂, Usubetsu, Sapporo, 17. vii. 1976 (Y. KUSUNOKI); 1♀, Asahi-mura, Teshio, 17. vii. 1953 (T. HASEGAWA); 1♂, Yunosawa, 29. vi. 1975; 1♀, loc. cit., 15. vii. 1975 (H. KOGI); 1♂, Hakodate-yama, Hakodate, 19. vii. 1974; 1♀, Shirikishinai, 31. vii. 1976; 1♂, Osatsube, Minamikayabe, vi. 1976, ex larva on *Salix* sp. (T. INOKO). Honshū—Aomori Pref.: 1♂, Takisawa, Aomori City, 14. vii. 1975; 1♀, Hahazawa, Inabetsu, 18. vii. 1977 (M. KASAI); 1♀, Juniko, 23. vii. 1974 (K. KUDO). Iwate Pref.: 1♀, Kitakami City, 5. vii. 1975, 1♂, Geto Spa, Kitakami City, 21. vii. 1971 (K. SATAKE). Akita Pref.: 1♂, 1♀, Tazawako-kōgen, Tazawako, 16. vii. 1972 (M. TAKAHASHI); 2♂, Tsurunoyu, Tazawako, 16. vii. 1974 (A. SASAKI); 1♂, Ōyu, Towada, Kazuno City, 9. vii. 1976; 1♂, loc. cit., 26. vi. 1976; 1♂, Bodaino, Towada, 28. vi. 1976; 1♂, Iwawaki, Takanosu, 7. vii. 1975; 3♂, Odase, Kamikoani, 9. vii. 1972; 1♂, Nakamo, Kamikoani, 9. vii. 1972; 1♂, Nibetsu, Akita City, 30. vi. 1973 (M. TAKAHASHI); 1♀, Magi Valley, Ōta, 23. vii. 1973; 1♂, Sannai, Honjō City, 29. vi. 1975 (A. SASAKI). Miyagi Pref.: 1♂, Komanoyu, Kurikoma, 1. vii. 1967; 1♂, Akiu-ōtaki, 21. vi. 1964; 1♂, Sakunami, 22. vi. 1969; 3♂, loc. cit., 3. vii. 1969; 1♂, Ayashi, Miyagi, 25. vi. 1964; 1♂, Togatta, 27. v. 1967; 3♂, loc. cit., 27. vi. 1967; 2♂, loc. cit., 5. vii. 1969 (T. WATANABE). Yamagata Pref.: 1♂, Shizu, 26. vii. 1975 (Y. KISHIDA). Niigata Pref.: 1♂, Miomote, Asahi, 23. vii. 1974; 1♂, Haige, Nagaoka, 14. vii. 1975; 1♀, Kakumi, Maki, 11. vi. 1977 (R. SATO); 1♂, Mt. Gomado, Tagami, 30. vi. 1974 (K. NAKANO); 1♀, Mt. Gozu, Sasagami, 2. vii. 1978 (A. SEINO). Gunma Pref.: 1♂, Niiharu-mura, 22. vii. 1959 (R. SATO); 1♂, Yunotaira Spa, 29. vi. 1968 (H. INOUE); 1♀, Kumanotaira, 14. vii. 1952 (H. HOSHINO). Nagano Pref.: 1♂, Yunomaru, 9. vii. 1978 (R. SATO); 1♀, Shimashimadani, 9. vii. 1976 (N. HIRANO); 2♂, Todai, Kami-inai, 8–11. vii. 1978 (M. OWADA). Yamanashi Pref.: 2♂, 29. vi. 1974 (K. KUDO). Tokyo: 2♂, Mt. Takao, 2. vi. 1949 (H. INOUE). Gifu Pref.: 1♂, Kabe, Itadori, 19. vi. 1976; 1♂, Shiratani, Tokuyama, 9. vii. 1977 (N. BI TO). Wakayama Pref.: 1♂, 1♀, Ōsugi-dani, Mt. Ōtosan, 1–4. vii.

1978; 1 ♂, Mt. Myohô-zan, 28–29. vi. 1978 (M. OWADA & Y. NISHI). Kyôto: 1 ♂, Kamikusano, 29. vi. 1946 (A. SIBATANI). Okayama Pref.: 1 ♀, Misogi Pass, Nishiawakura, 27. vii. 1976; 1 ♂, Tenno, Kamisaibara, 28. vi. 1975 (H. UNO). Shikoku—Kagawa Pref.: 1 ♂, Fudôdaki, 18. vi. 1971; 1 ♀, Fujio-jinja, Takamatsu City, 6. vi. 1977 (T. MASUI). Kyûshû—Fukuoka Pref.: 1 ♂, Hikosan, 11. vi. 1951 (T. SHIRÔZU). Kumamoto Pref.: 2 ♂, Mt. Hakuchô, Izumi, 13. vii. 1974; 5 ♂, 1 ♀, loc. cit., 10. vii. 1977; 4 ♂, 1 ♀, loc. cit., 23. vii. 1977; 5 ♂, loc. cit., 8. vii. 1978 (I. ÔTSUKA). Is. Tsushima—2 ♂, Ôboshiyama, 2. vii. 1973 (T. WATANABE). Is. Quelpart—1 ♂, Kannonji, alt 600 m, Mt. Hanna, 11. vii. 1968 (T. SHIRÔZU & Y. NISHIDA). Korea—1 ♂, Mt. Solaksan, 6. vii. 1969 (S. W. PAK).

Distribution. Japan: Hokkaido, Honshû, Shikoku, Kyûshû, Tsushima; Korea, Quelpart.

Ecological notes. The two preceding species reproduce at least two or three generations, but this species is presumably one brooded. Hibernating stage is unknown, but probably the larva. I have examined one male reared on *Salix* sp. (Salicaceae) at Hakodate, Hokkaido. Larvae hatched from eggs laid by one female taken at Mt. Gozu, Niigata Prefecture by Mr. A. SEINO, were reared on *Salix babylonica* (Salicaceae) and *Prunus apetala* (Rosaceae). Probably polyphagous. Much work is needed for the immature stages and the host plants.

Remarks. The distributional pattern is different from *fuscaria*. The present new species is confined to higher altitude and latitude in Japan. So far as I am aware, Mt. Takao, Togatta, Ôsugi-dani and Ôboshiyama are the places from where both the species were found.

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References

MINAMIKAWA, J., 1951. Biological notes on the three brood tea looper caterpillar, *Jankowskia athleta*

OBERTHÜR (Lep. Geometridae). *Jap. J. Appl. Zool.*, **16** (3.4): 1-9. (In Japanese).

NAKAJIMA, H., 1975. Notes on the larvae and food-plants of some Geometridae IX. *Yûgato, Niigata*, (62): 107-109. (In Japanese).

——— 1978. Notes on the larvae and food-plants of some Geometridae XV. *Ibid.*, (71): 12-14. (In Japanese).

SATO, R., 1976. Notes on the larvae of Japanese Geometridae XXIV. *Yûgato, Niigata*, (63): 29-32. (In Japanese).

SATO, R. & H. NAKAJIMA, 1975. A list of the food-plants of the Japanese Geometridae I. Ennominae. *Japan Heteroc. J.*, (Suppl. 2): 1-56. (In Japanese).

摘要

従来わが国で *Jankowskia athleta* OBERTHÜR チャノウンモンエダシャクとよばれていた種に、2種混じていていることが判明した。本報ではウスリー産の眞の *athleta* を再記載すると共に、2新種、1新亜種を含め、日本、台湾、朝鮮の *Jankowskia* を次のように整理した。

J. fuscaria fuscaria (LEECH) チャノウンモンエダシャク

本州、四国、九州、対馬、屋久島、朝鮮に分布。今のところ日本海側では新潟、太平洋側では宮城が最北の産地。年3化(地域によってはおそらく2化)。2-4令幼虫で越冬。茶の害虫として著名だが多食性である。

J. fuscaria naitoi SATO

奄美大島、沖縄に分布。外観だけでなく雌雄交尾器の形態にもかなりの差があるため亜種として記載した。

J. taiwanensis SATO タイワンウンモンエダシャク (新称)

前種よりはるかに大きい。台湾における *fuscaria* の代置種といえよう。

J. pseudathleta SATO キタウンモンエダシャク (新称)

Fuscaria に似るが、全体に黒っぽく、前後翅共外横線の外側が黄色味強く赤味を帯びないこと、後翅の中横線から基方が *fuscaria* のように淡色を呈しないこと、雄触角の櫛歯が短いことなどで外観でも容易に区別される。北海道、本州、四国、九州、対馬、朝鮮に分布。北海道と青森、秋田、岩手、山形の各県では今のところ本種の記録しかない。両種を産する県では、一般に *fuscaria* が平地~低山地に、本種がやや高標高の地に分布している。年1化。おそらく幼虫で越冬する。猪子龍夫氏による *Salix* からの幼虫の記録があるのみだが、孵化幼虫の飼育観察から多食性と推定している。